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SOCIAL AMELIORATION AND EUGENIC PROGRESS

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THE relation between social progress and the improvement of the inborn qualities of the human race is a question upon which we meet with much difference of opinion. The progress in ideas and institutions which forms so conspicuous a feature of our recent history by no means implies a corresponding improvement in the characteristics that we owe to heredity, and in fact may go along with biological decadence. Civilization, biologically considered, is a comparatively recent and somewhat anomalous racial experience, and it brings in its train a number of agencies which tend to oppose the operation of those selective forces which most biologists regard as mainly responsible for the evolution of organic life. Our modern warfare in leading to the elimination of our best stocks; our fostering of the weak and defective; the decline of the birth rate among those classes of society which have risen into the successful ranks—all tend to recruit the next generation from stocks of relatively inferior racial qualities. There is little doubt that the most potent of these forces is the relative sterility of those classes whose inheritance of desirable traits of mind and character we have every reason to believe is above the average. In the animal world individuals that attain supremacy over their fellows generally succeed in leaving the most numerous progeny. But under modern social conditions this natural relationship between net fecundity and the qualities that lead to supremacy has undergone a curious reversal. Those who succeed leave few offspring, while the failures, the mentally subnormal and the improvident who are restrained by no considerations of prudence from perpetuating their kind and leaving them to the tender mercies of Providence or the poorhouse, continue to multiply with relatively unabated rapidity. Whatever may be the forces working towards the improvement of our hereditary endowments, it is evident that so long as preponderating fecundity belongs to those who drift instead of to those who attain mastery the race stands in very serious danger of deterioration.

It is unnecessary to dwell further upon this situation which has been discussed so frequently in recent years. Our present aim is to enquire whether or not the future improvement of our social institutions, granting that they continue to improve, promises to counteract, in any effective way, the forces that are now working toward racial decadence.[1] Most people look forward optimistically to an era of accomplished reform when education and culture will become much more widely spread, when wealth will be more equitably distributed, and when people in general will be good and happy. Assuming that these sanguine expectations will be in the main fulfilled, what will be the probable effect upon our racial inheritance?

Unless one were a Lamarckian and believed that the results of individual improvement were bequeathed to following generations, the answer to this question would not be immediately evident at least. Most biologists at the present time are not Lamarckians, and their answer to the question would probably depend upon their estimate of the way in which the various selective agencies to which mankind is exposed are affected by social progress. There are many factors, both social and biological, which must be considered in dealing with this problem; and judging from the expressed opinions of a number of biologists one may be pretty sure that the question would be answered in several different ways.

Writers on social evolution often assume a certain antagonism between racial welfare and the general improvement of the conditions of life. Conditions must be bad enough, at least for a goodly number of people, so that the "beneficent working of the survival of the fittest" is not interfered with. Herbert Spencer warns legislators against any artificial interference with the competition whereby the ill-endowed are condemned to "abject misery" and early death. "Manifestly," he says, "an opposite régime, could it be maintained, would, in course of time, be fatal to the species." According to Professor Haeckel,

> The theory of selection teaches us in human life, exactly as in animal and plant life, at each place and time only a small privileged minority can continue to exist and flourish; the great mass must starve and more or less prematurely perish in misery. . . . We may deeply mourn this tragic fact, but we can not deny or alter it. "Many are called but few are chosen." This selection, this picking out of the chosen, is necessarily combined with the languishing and perishing of the remaining majority.

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[1] A discussion of some of these forces is contained in an article by the writer on The Decadence of Human Heredity which appeared in the Atlantic Monthly for Sept., 1914.

If the weak must be crushed in order that the best types may inherit the earth it is obvious that a condition of society which greatly improves the living conditions of the less highly favored of the human breed would be fatal to the evolution of the race.

It is scarcely necessary to point out that Haeckel's picture of selection in human society is grossly overdrawn. But the central idea expressed, *i. e.*, the necessity for maintaining the struggle for existence in order to insure progress, is voiced by a number of post-Darwinian writers on social evolution. To quote the words of a prominent social Darwinist, Mr. Benjamin Kidd:

> We shall perceive, when we understand the nature of the forces at work beneath the social phenomena of our time, that in whatever direction we may cast our eyes, there is no evidence that the rivalry and competition of life, which has projected itself into human society, has tended to disappear in the past, or that it is less severe amongst the most advanced peoples of the present, or that the tendency of the progress we are making is to extinguish it in the future. On the contrary, all the evidence points in the opposite direction. . . . The races who maintain their places in the van do so on the sternest conditions. We may regulate and humanize those conditions, but we have no power to alter them; the conflict is severest of all when it is carried on under the forms of the highest civilization. The Anglo-Saxon looks forward, not without reason, to the days when wars will cease; but without war, he is involuntarily exterminating the Maori, the Australian, and the Red Indian, and he has within his borders the emancipated but ostracized Negro, the English Poor Law, and the Social Question; he may beat his swords into ploughshares but in his hands the implements of industry prove even more effective and deadly weapons than the swords.
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> These are the first stern facts of human life and progress which we have to take into account. They have their origin not in any accidental feature of our history, nor in any innate depravity existing in man. They result, as we have seen, from deep-seated physiological causes, the operation of which we must always remain powerless to escape.

Individual man, as Mr. Kidd conceives him, is but a pawn in Nature's game—a game in which he as an individual has no particular interest. Nature, "so careful of the type" and "so careless of the single life," is ever ready to sacrifice the individual in the interest of the social organism to which he belongs. "The teaching of reason to the individual," says Mr. Kidd, "must always be that the present time and his own interest therein are all-important to him. Yet the forces which are working out our development are primarily concerned not with these interests of the individual, but with those widely different interests of a social organism subject to quite other conditions and possessed of an indefinitely longer life."

To induce man to sacrifice his interests and to work for the welfare of his social group is a problem which Nature has solved by endowing him with various social instincts and emotions, and particularly with those traits which make him a religious animal. As only egoism is rational, according to Mr. Kidd, man must be bamboozled into altruism in some way if Nature is to gain her end of promoting human progress for which, it is claimed, there is "no rational sanction." To effect this consummation is the lofty function of religion. By furnishing him with non-rational sanctions for conduct which makes for social as opposed to individual welfare, Nature has made man a willing dupe, content to tolerate a social system in which natural selection has free play and in which much misery must be endured in order that social evolution may continue its course.

This is, I think, a fair statement of Mr. Kidd's view, though expressed in phraseology less dignified and persuasive than that which captivates the readers of "Social Evolution." It is but natural for Mr. Kidd to conclude that the evolution which is now going on in the human race, and which has been going on for many centuries, is not primarily in the field of intellect, but of instinct. Nature does not favor the development of intellect beyond the point at which the latter becomes unmanageable and refuses to subordinate itself to Nature's ends. The great danger that comes from the gradual extension of the sphere of individual rights, and the emancipation of the intellect from the reign of dogma is that the subordination of individual to social welfare may become so weakened that the life of the group is seriously imperiled. A discordant individualism is a decided military disadvantage, whatever may be said for it in other relations. Selection would therefore favor those groups in which the instincts that secure subordination and effective coordination were best developed, and in which the intellect was kept in a proper subjection to the instincts which afford the basis of social organization.

From Mr. Kidd's standpoint the prospect of much further advancement of the intellectual endowments of the race is not encouraging. Reason, being essentially anti-social, must be directed to social ends by instinct, or through institutions founded on instinct, which afford the necessary non-rational sanctions for social behavior. It is assumed that whatever advances we may make in the future must be accomplished through intense rivalry and the elimination of the unfit. Rivalry within the group leading to the suppression of inferior individuals, and rivalry between groups leading to the elimination of tribes and nations which have less corporate efficiency must continue to exist unless degeneration overtake the race. Racial progress, like the bloodthirsty gods of the ancient Aztecs, must have its human victims. If our social order does not furnish them we shall pay the heavier price of insidious racial decay.

For a social philosophy of this sort the hope of a future state of society in which there shall be no more war and no squalid poverty, and in which individuals may live with comparative ease and comfort, freed from the hardships of an oppressive struggle for existence, is an idle dream. Fate has decreed that such things can not be, or at least, that they can not last. Has Mr. Kidd presented a faithful account of the actual operation of selective forces in human society? Though less obviously overdrawn than the picture given by Professor Haeckel, the presentation of the situation in "Social Evolution" is permeated by the same misconceptions and limitation of viewpoint. There was a tendency among earlier post-Darwinian writers, notwithstanding Darwin's warning to the contrary, to conceive of the struggle for existence in a too literal sense as necessarily implying rivalry, a sort of "Hobbesian war of each against all" resulting in the elimination of the weaker individuals. It was customary to look upon Nature as "red with tooth and claw" and to picture the struggle for existence as an active encounter of rival organisms in which victory came as the reward of strength or cunning. As a matter of fact a very large part of the selective elimination that takes place in the organic world is accomplished in a very peaceful and unobtrusive way. What may properly be termed rivalry, or the struggle of one organism with another, constitutes but a part, and in many species a very minor part, of the selective process. Organisms may survive by virtue of increased resistance, freedom from organic defect, or the possession of better adaptations to countless environmental agencies, without involving anything of struggle, except in a very figurative sense, of one organism with another. Doubtless the kind of struggle in which the success of one individual is based upon the failure of another, as in actual conflict or rivalry for food or mates, has played a very important rôle in the evolution of animal life, but, like other forms of selection, its incidence changes with circumstances. If it has tended to produce higher types of life among the animals below man, it does not necessarily follow that it will work in a similar way among civilized mankind. Natural selection may favor progressive evolution at one time and degradation of structure and function at another. And we should therefore proceed with caution in applying our biological formulas from one group to another when we are dealing with problems of progressive development. How any form of natural selection operates under the complex circumstances of human civilization can not be decided *a priori,* but only by a careful study of its actual operation. It is quite possible, therefore, that the biologically novel conditions of civilized life may have involved such modifications of the workings of competitive struggle that its actual effects are very different from what they are in the lower animals.

To conceive of natural selection solely in terms of one of its methods of operation, that of competitive struggle, and to assume that competitive struggle is necessary for the progressive evolution of men, are two fundamental errors that are only too commonly found in the writings of the social Darwinist school. Upon these doctrines as a foundation has been reared more than one superstructure of social philosophy which has doubtless influenced in no small degree the international relationships of modern states. It is scarcely necessary to dwell upon the extreme importance of the deductions which might logically be drawn if the biological doctrines we have mentioned are of universal validity. We are only too familiar in these days with the policy and practises which a perverted Darwinism has been used to support.

Competitive struggle may take place between groups, or between individuals within a group. In intra-group rivalry, physical encounters have been all but entirely superseded by economic competition, and the latter seems to have increased as civilization has advanced. But competitive struggle within a group seldom leads directly to elimination, although it may give rise to conditions of life which cause an increased death rate. Those who are forced by this struggle into the ranks of the dependent classes, far from being extinguished, respond by an enhanced fecundity which more than offsets their increased death rate. As a result of forces peculiar to our social régime there has come to be established a biologically anomalous correlation between failure and fecundity which deprives of much of their force the pleas for the value of competitive struggle.

We may be told that the reason for the failure of competitive struggle is because we are too humane and extend the helping hand to too many who, in the interest of the race, should be allowed to perish. It is questionable, however, if the withdrawal of all organized and private charity would produce a much higher death rate among the ill-endowed than occurs today. But whatever some writers might deem more favorable conditions for racial evolution, it is evident, I think, that the actual workings of competitive struggle are quite different from what have been pictured by most social Darwinists.

The deteriorating effect of unmitigated industrial competition has been clearly brought out by Prof. Karl Pearson in his criticisms of those social Darwinists who attempt to use the Darwinian theory of natural selection as an argument against socialism. While Pearson and his co-workers have attempted to demonstrate by statistical methods that natural selection is a potent factor in man as in lower organisms, the contention is made that it is not through the struggle of man with man for the necessities of life that its racial benefits are brought about. Conditions which entail a high death rate among the ill-endowed are apt to prove unwholesome to many others as well, and would therefore produce a general deterioration of the efficiency of the whole social group. A country in which a considerable proportion of the inhabitants are forced by industrial competition into conditions of squalor that sap the energies of mind and body, and in which a still larger part of the inhabitants suffer more or less injury from the severity of the struggle for existence, can scarcely compete on equal terms with a nation whose population enjoys a higher and more wholesome standard of living. A piece of mechanism which uses up a great deal of energy in internal friction is not an effective product. And a country which permits internal rivalries to waste its resources of human life is poorly equipped for any contest which may endanger its national existence.

In common with many militaristic writers Pearson attributes an important rôle to group selection whether it takes the form of actual war, or competition for markets, trade routes and spheres of influence. It is undeniable that this factor has been a potent one in the progressive evolution of man, but it is dangerous to conclude that it will continue to function in the same way under the peculiar conditions of our modern civilized life. Struggle of group with group has developed the instincts that make for mutual support and corporate efficiency; in a word, it has moulded man into a social animal. But our debt to this stern mother of altruism should not be taken as incontestable evidence that her services will always be indispensable.

Under modern systems of warfare it is not so much blood that tells as organization, training and equipment. Which of the warring nations of Europe is most favored by inherited endowments is still far from being established. Practically all of them are mixtures of ethnic stocks to a degree that a racial analysis is well nigh impossible. And whatever the issues of the present war may be, there is no assurance that the inhabitants of the victorious nations will multiply more rapidly than those of the vanquished. Among civilized peoples war generally leads to the extension not of a people, but of power, policies and financial gain. A nation may be vanquished by war, time after time, as Austria has been during the nineteenth century, and at the same time increase in population, wealth and military strength.

Should wars be carried on to the extermination of the vanquished they might be justified on biological grounds, provided of course that the victors owed their supremacy to their innate superiority instead of to organization, equipment, discipline, numbers, or any of the other circumstances that commonly decide the issue between contending armies. To a certain extent it is perhaps allowable to assume that those peoples with the best endowment of intellect and character will, on the average, develop the most efficient preparation for war. Notwithstanding all that has been written from DeGobineau to Houston Chamberlain and Madison Grant on the innate superiority of this or that chosen people, the differences in culture and military efficiency among modern civilized nations are much more clearly traceable to extrinsic causes than to any factors which can be specified by the biologist. Russians and Servians retreat before well-drilled and equipped German armies for much the same reason that the ancient Germans and Gauls were unable to stand before the legions of the Romans. Nations march forward on the road to civilization at a very unequal pace. And history has repeatedly shown that the backward and relatively defenseless people of one era may prove to be the highly cultured and conquering nation of the next.

It is not to be inferred that civilized peoples have an equivalent inheritance. They differ quite evidently in temperament and instinctive bent, but, while they probably differ also in their intellectual aptitudes, we know too little on this score to distinguish the effects of hereditary from environmental factors. Any successful attempt to evaluate the innate mental differences of peoples would involve a thorough investigation by the best modern methods and on an extensive scale. As no such investigation has ever been made we have no very adequate basis for asserting which of the civilized peoples of the earth are the most highly gifted with inherited qualities.

It may seem very plausible to speak of the advantages accruing from the conflict of nation with nation and the consequent survival of the best endowed stocks. But even if the victory came to the peoples having superior hereditary qualities, it by no means follows that the vanquished would be supplanted by the victor. Should conflict result in placing a nation in a position of economic disadvantage such as would result if it were overrun by its conquerors who monopolize the positions of power and profit, the probable result would be that the conquered would outbreed their conquerors and regain through the cradle what was lost on the battlefield.

Under other conditions, however, where conflict leads to the expansion of a victorious people who replace the primitive inhabitants of the realm, or where industrial supremacy yields the material support for an increased population group rivalry may effect a racial advance. The Anglo-Saxon people have doubtless profited by both of these means. Conflicts with inferior races in so far as they prove to be directly or indirectly wars of extermination may lead to racial improvement, but the biological effect of war between civilized states is a much more difficult problem.

In view of the many considerations involved in such problems it is evident, I think, that the influence of group selection can not be determined *a priori* simply by the extension of a biological formula to human society. Group selection, like intra-group selection, may work in very different ways according to circumstances. Social philosophers who seize upon biological formulas and apply them uncritically, as they usually do, to the evolution of human society are apt to be led into very erroneous conclusions on matters of the gravest import. Just as competitive struggle between individuals may, under our present régime, give rise to injurious effects which more than outweigh its advantages, so may the struggle between groups lead to results quite at variance with what is commonly supposed to occur. We have become so imbued with the idea that the struggle for existence simply means that the weak go to the wall while the strongest and most highly developed come out ahead, that we lose sight of the ulterior consequences of the process, and especially the fact that the changes wrought by selective forces may be progressive or retrogressive as a multitude of attendant circumstances determine. It should always be borne in mind that the course which it is biologically most advantageous to follow is not infrequently the downhill path. Whether warfare, or any other form of group struggle, leads nations along the path of progress, either biologically or culturally, is a question which can not be solved by abstract and general disquisitions on the survival of the fittest or the manifest destiny of superior peoples. It is a question which must be solved in each particular case by a thorough inductive inquiry.

Investigations of the biological effects of war have been few. It is scarcely to be gainsaid that in modern warfare the most vigorous and efficient suffer the greatest loss of life at the front, leaving the race to be continued by the less desirable parents who remain behind. But for the full determination of the biological effects of war we must pass beyond the effects of individual selection within the group to the biological outcome of the struggle of one group with another. One may contend with Steinmetz and Schallmeyer, who concede that military selection tends to destroy the best blood of the nation, but who maintain that the biological advantages of the victory of the superior forces more than compensate for this evil. Satisfactory proof of this thesis, however, demands much more critical work than that which has been devoted to the task. The studies of La Pouge, Ammon, and a few others who have attempted to investigate what the effects of group selection actually have been, have made little more than a feeble beginning of an undertaking beset with many difficulties and full of unexpected developments beyond the conception of most proponents of militarism. It is important to recognize that the imaginary solutions of this problem that have so long passed for the real ones and have been taken as postulates by such writers as Von Moltke, Steinmetz and Bernhardi in their attempts to justify war on the grounds of biological necessity have little support from inductive investigation. Whatever may be said in favor of war on other grounds, the biological argument is one of very dubious value, especially as applied to the struggles between modern civilized states.

If neither individual competition nor group selection has the unequivocal importance for racial progress that has been attributed to it, the consequences of social amelioration and exclusive devotion to the arts of peace may not, after all, be so disastrous, at least biologically. But if social evolution has so modified the operation of these factors that they can no longer be regarded as obviously making for race progress, to what must we look for further advance? Natural selection is doubtless still operating in various ways. We know as a matter of fact that some hereditarily degenerate types are on the average short-lived, and that strains with a diathesis to certain diseases tend to die out. Several of the studies on natural selection in man, especially those dealing with the racial influence of infant mortality, have yielded results about which there has been considerable controversy. To ascertain just how natural selection is operating among human beings is a problem involving many technical difficulties that often tax the abilities of the most expert biometrician. There can be little doubt, however, that the intensity of natural selection has been diminished through the advances of medical science, and that it will continue to decrease with the improvement of the conditions under which people live. In some respects this diminished activity will be racially bad, but if social amelioration should bring about the abolition of warfare and equalize the birth rate so as to check some of the prevalent evils of differential fecundity it is not improbable that the net result would be advantageous.

There is one factor in our problem which we have not yet considered and which, despite its very great importance, has been almost entirely neglected in considering problems of human evolution, and indeed problems of evolution in general. This is the question, How does the changing complex of environmental forces which is brought about by social evolution affect the kinds of variations that are produced as material for the action of selective forces? It is obvious that if hereditary variations did not arise from time to time, selection would be unable to accomplish anything. It is equally obvious that whatever selection can accomplish is conditioned upon the kinds of variations which are offered for its choice. The selective breeder would never be able to create a race of six-toed cats unless an occasional kitten with more than five digits should happen to present itself. No breeder of plants would try to produce a grass with divided leaves because no trace of such a variation has ever been known to occur in human experience. Natural selection must take what has arrived as a basis for what it may succeed in building up. It is like a builder who employs the stones fashioned for him by some one else, and whose choice is limited to using or rejecting what is supplied to him. A builder could never erect a marble palace if his materials were limited to a varied assortment of cobble stones. And natural selection could never produce anything not already fashioned beforehand by those forces, whatever they may be, that determine the nature of hereditary variations.

What causes hereditary variations to arise in organisms is a subject about which we know almost nothing. One can number on the fingers of one hand the investigations of any importance that deal with this problem. Beyond the fact commented on by Darwin that changed conditions of life tend to enhance variability, very little was known about the production of variations through environmental changes until the experiments of Tower showed that in the Colorado potato beetle a high temperature and an unusual degree of humidity during the period of maturation of the sex cells resulted in the production of well-marked mutations which bred true to type. The stability of these new mutations indicated that they owed their origin to changes in the germ plasm brought about by changed external conditions. In the evening primrose, *Œnothera lamarckiana,* and a few other plants stable mutations have been produced by the action of chemicals injected into the ovary, and by treating the plants with rays emanating from radium.

The experiments thus far performed afford a certain amount of evidence for the conclusion, to which one would naturally be disposed on *a priori* grounds, that the kinds of variations that arise in organisms are conditioned by the nature of environmental forces. If this be true, we are naturally led to enquire how the changing environment to which civilization exposes the human race affects the trend of variations that arise in the germ plasm. With our unnatural indoor life, the unwholesome living conditions of a large part of our wage-earning population, the increasing drift of people into large cities, our alcoholism, and our numerous diseases, it can hardly be expected that the germ plasm of the race will escape being affected in some way. But how? Here we are compelled to confess practically complete ignorance. Were we to judge by analogy with what has happened with our domestic animals, which are relatively degenerate from the standpoint of physical vigor and general intelligence, the probable outcome would not be reassuring. We might be disposed to infer that germinal variations arising in response to agencies which impair the vitality of the body would probably give rise to inferior progeny. The disastrous effects of lead poisoning upon the children of workers in lead, even when the father alone is affected, may be an indication of the kind of influence which might be anticipated from the action of an unwholesome environment. We know too little, however, of the permanence of the transmitted effects of lead poisoning to base anything more than a very tentative supposition on these results.

With regard to the important question of the hereditary influence of alcohol our knowledge, although still very unsatisfactory, affords some ground for more or less probable inference. While statistics show that epilepsy, insanity, and feeblemindedness occur with much more than average frequency among the offspring of parents addicted to alcohol, this correlation may be due to the fact that parental alcoholism is so often the result of a neuropathic constitution, and that it is the inheritance of this constitution, and not the effect of parental intemperance, that disposes the children of alcoholics to various forms of nervous malady and mental defect. Statistics may discover correlations but they are seldom adequate for establishing causal connections. As the method of experiment to which recourse must usually be had in the endeavor to ascertain causes can not well be applied to human beings, the most promising field of enquiry is afforded by experiments on animals. If alcohol were found quite generally to produce hereditary defects in animals, we should have a strong argument in favor of its producing similar results also in man.

Of the investigations that have yielded indications of the injurious hereditary effects of alcohol, the recent work on guinea pigs by Stockard and his colleagues is the most noteworthy. The animals employed were bred and shown to be capable of producing normal offspring before they were subjected to the influence of alcohol. Control experiments with untreated animals were also carried on side by side with animals to which alcohol was given, and the offspring of the two sets carefully compared. Without describing the methods of experimentation or giving the details of the results, it may suffice to state that the alcoholized guinea pigs gave rise to a much larger proportion of still-born offspring and offspring which lived but a short time than did the controls. It is particularly noteworthy that when the male parent alone was given alcohol the percentage of defective offspring was strikingly large, although the largest proportion was obtained from the matings in which both parents were alcoholized. It was further shown —and this is particularly significant in relation to our problem—that when the offspring of alcoholized parents were bred without being subjected to alcohol they gave rise to a large percentage of defective animals. Deformities such as an eyeless guinea pig, animals with a reduced number of digits, dwarfs, and many other kinds constituted 5.23 per cent. of ordinary alcoholic strains, and 14.81 per cent. of inbred alcoholic strains, while no deformities appeared among the animals bred from normal parents.

These experiments, unlike most previous studies, were carried out on an extensive scale and with due checks and controls, and they seem to afford strong evidence for the conclusion that alcohol administered to guinea pigs gives rise to defects in the progeny which are capable of being transmitted to subsequent generations. Recently Pearl has applied Stockard's methods to the domestic fowl, but instead of obtaining evidence of inherited injury he found that the progeny of the treated birds were slightly above the controls in fecundity and apparent vigor. These results are not necessarily inconsistent with those obtained by Stockard, since the germ plasm of the fowl may be much less easily affected by alcohol than that of the guinea pig. Further experimental work on this important topic is much to be desired before we can be entirely justified in drawing conclusions concerning the hereditary influence of alcohol in man. At present, all that we are warranted in inferring is that alcoholism in man is a more or less probable source of hereditary defect.

The same guarded conclusion should be drawn, I believe, in regard to other so-called "racial poisons." The terrible consequences which luetic infection entails upon following generations are primarily due to the transfer of pathogenic germs from parent to offspring, instead of to heredity in the proper sense of this term. Nevertheless, it is a distinct possibility that the toxins carried in the bodies of the unfortunate victims of this common malady may injure the germ plasm in such a way as to give rise to strains with a true hereditary defect. We may have similar suspicions that the same result may be produced by tuberculosis and other diseases; but unfortunately in regard to most of these questions we can only indulge in speculation. Did we know what agencies give origin to our strains of imbeciles, lunatics and morons we might be able to nip in the bud one of the most serious of our social evils. We may have a shrewd suspicion that our modern régime with all its institutions which conspire to sap the vitality of the race is continually adding new strains of such undesirables. When experiments on the causes of variability in the lower animals have yielded us a large body of well-organized knowledge, instead of the meager and scrappy information which we now possess, we shall doubtless be in a position to draw conclusions of a high degree of probability regarding the trend of variability in man, and possibly to bring this variability in a measure under control.

Any consideration of the influence of social amelioration upon the evolution of racial qualities has to take into consideration the question of how the trend of variation in human beings will probably be affected. If, as seems not improbable, intemperance, disease, and possibly bad living conditions are productive of hereditary defect, our racial welfare may not be seriously menaced by the reduced action of selection which would probably follow upon the institution of social and economic reforms. On the contrary, the race may be freed from sources of continued contamination which act as a check upon its progress. A social system which presumably favors the "beneficent working of the survival of the fittest" by creating conditions of life that lead to a high death rate among the less successful types, may not only fail to eliminate these types, as we have attempted to show, but may be a means of actually creating the inferior variations which it is supposed to destroy.

Our aim thus far has been to show that the realization of Utopian dreams of a state of society in which the evils of poverty, intemperance, severe individual struggle and warfare have been relegated to the past does not necessarily entail biological decadence. In fact, there are reasons for believing that such a consummation would do away with many of our present sources of racial deterioration. Would it also set into operation any agencies which would promote racial advancement?

If the cure for democracy is more democracy, it may also be true that the cure for the cure for the racial evils of civilization is more civilization. An enlightened society, possessing a knowledge of the principles of its own evolution, and mindful of the welfare of future generations, may accomplish much in the direction of eugenic progress. The control of the birth rate which mankind is now exercising from prudential considerations, or the more laudable motive of giving better advantages to a few children rather than mere maintenance to many, might, in such a society, be utilized more for social and less for individual ends. With parenthood placed upon a voluntary basis we might reasonably expect that the less desirable stocks would show an increased tendency toward elimination and that the rearing of children would be undertaken in greater measure by the classes more amenable to the influence of the sense of racial obligation.

Alfred Russel Wallace entertained great hopes of race improvement through the financial emancipation of women. When women are no longer tempted to marry for support they will, according to Wallace, be more apt to select only superior types of men to be the fathers of their children. As a means of race improvement doubtless marriage selection has magnificent possibilities. But when we reflect upon the frequency of marriage among the Jukes and Kallikaks on the one hand, and the low marriage rate of women graduates of colleges on the other, it must be admitted that, as a factor in race progress, marriage selection at present is a miserable failure. Mere economic reform can not be relied upon to improve matters greatly unless it is accompanied by a general diffusion of education; and education will avail little unless it includes the inculcation of a sense of responsibility for the hereditary qualities of future generations. Education is eugenically of value chiefly as affording a basis for the development of a "eugenic conscience" which is now sadly lacking in most people of culture. It is a hopeful sign, however, that here and there among people who have inherited a generous measure of desirable traits eugenic considerations have led to the rearing of larger families. One is therefore encouraged to have sufficient confidence in human nature to believe that the spread of eugenic education, so that people of superior endowments will have the matter of their obligations to the race brought squarely home to them, will not fail to have an effect in checking the evils of our present differential fecundity.

Racial improvement has doubtless very intimate relations to the improvement of the economic conditions which now oppress a very large proportion of mankind. A society with well-marked castes will probably make little progress if it includes an ignorant and poverty-ridden proletariat. Under a régime which affords better educational advantages and a higher standard of living for the less successful classes, the relatively high birth rate of those who multiply through sheer lack of restraint would probably be reduced. Economic reform is by no means the panacea for racial and social ills that it is apparently taken to be by many socialistic theorists, but it would afford conditions under which the operation of eugenic ideals would doubtless be more effective than under our present social order. Greater equality in the distribution of wealth would tend to bring about greater equality in the birth rate of different classes. With a higher general standard of education and a diffusion of the sense of obligation to transmit socially valuable qualities to future generations, conditions might possibly be changed so that a greater relative fecundity would come to characterize the more vigorous, intelligent, and public-spirited members of the community. Should society succeed in restoring the correlation between fecundity and the possession of superior qualities—a correlation which our present civilization has pretty effectually subverted—humanity would once more be on the highway of racial advance.